A drawing correction is being sent to the Draftsperson making the corrections noted in the Office Action. Additionally, drawing corrections of Fig. 7A are being requested to correct the point at which the section for Fig. 7B is taken; to correct the numbering in Fig. 7C; to add alphabetic characters to the reference characters in Fig. 7B and 7C to distinguish the two variations of the engaging torque mechanism and to correct the identification of the nose and mouth components in Fig. 7C; to correct the lead line for the component 2018 in Figs. 12B-12D; and to show the figure number for Fig. 22. Additionally, the specification has been amended to include a description of the spacing ring 2008, identified in Figs. 12A-12C but not specifically described in the specification.

It is respectfully submitted that the drawing corrections proposed herein, as well as the modification of the specification to conform to such drawing corrections, do not add new matter in that they are obviously supported and apparent from the description of the invention as originally filed.

As presently amended, Claims 1, 2, 4-9, 13, 14, 17-19, and 21-23 are presented for examination.

Applicants acknowledge with appreciation the indication of allowability of Claims 10-12. Applicants have submitted new Claims 21-23, corresponding, respectively, to cancelled Claims 10-12 and rewritten to overcome the rejections under 35 U.S.C. §112, as well as to include all of the limitations of the base claim and intervening claims. In this regard, base Claim 1 has been amended to recite the apparatus as being for use in a drill string and drill bit assembly to provide antecedent basis for the drill bit limitation in the claim. This change has also been incorporated in the new claims submitted to replace cancelled Claims 10-12.

Applicants' Claims 1, 2, 4, 6-9, 13, and 17 stand rejected under 35 U.S.C. §102 as being anticipated by *Frear et al.* This rejection is respectfully traversed. The *Frear* disclosure is of

a ball joint connection in a high torque driving and driven shaft assembly. The torque transfer components of the *Frear et al.* assembly include metal pins 85 positioned between retaining metal pin chambers 28 and metal grooves 50. Axial forces are contained between metal bearings 35 and 80. Thus, the torque and weight-bearing components of the joint are all metal. Applicants' Claim 1 calls for a resiliently connecting member that allows tilting while transmitting torque and weight. Such structure is lacking in the *Frear et al.* teaching. While the members 77 and 45 are resilient and deformable, it is respectfully submitted that such elements are included in the assembly for the purpose of sealing and are not resiliently deformable for tilting members relative to each other while transmitting torque and weight. Applicants' Claim 9 adds the further limitation that the elastomeric spacer comprises a hydrogenated nitrile rubber having a Shore A hardness of at least 80. It is respectfully submitted that while the *Frear et al.* reference not only fails to teach a resiliently deformable member as defined in Applicants' Claim 1, it also fails to specify a particular material as defined for such a resilient component in Applicants' Claim 9.

It is respectfully submitted that Applicants' Claim 17 calls for a "resiliently deformable connecting member" in which the two members of the assembly may be tilted and moved laterally with respect to each other under an applied load. It is respectfully submitted that neither the seal 45 nor the seal 77 comprises a connecting member and that the two components of the *Frear et al.* assembly are not in a free-floating relationship that allows one of the members to tilt and move laterally with respect to the other under an applied load.

Applicants' Claims 1, 4, 6-9, and 17-19 stand rejected under 35 U.S.C. §102 as being anticipated by the German '639 reference. This rejection is respectfully traversed.

The German '639 reference discloses a toothed connection (46) arranged axially between two spherical-segment bearings. No resiliently deformable connecting member is apparent

between the relatively movable members of the toothed connection for tilting the two members with respect to each other while transmitting torque and weight from one member to the other. It is respectfully submitted that the German '639 reference is similar to that of the *Frear et al.* reference and lacks the elements recited in Applicants' claims for the reasons already advanced with regard to the *Frear et al.* reference.

Applicants' Claims 1, 4, 5, 8, 9, and 17 stand rejected under 35 U.S.C. §102 as being anticipated by *Black*. This rejection is respectfully traversed. It is respectfully submitted that the *Black* flexible joint lacks a resiliently deformable connecting member that transfers weight between the two members of the connection. As may be observed in Fig. 1 of the *Black* patent, the connection engages in metal-to-metal contact between the faces 24 and shoulder 24A and the face 25 and flat bottom 25A. In this compressed condition, with the weight of the string 20 resting in metal-to-metal engagement with the remainder of the drill string below the joint, there is no resiliently deformable connecting member between the components. Thus, while the connecting member of *Black* permits tilting, it fails to transmit weight between the two members in a free-floating relationship.

Applicants' Claims 1, 2, 8, and 9 stand rejected under 35 U.S.C. §102 as being anticipated by *Bodine*. This rejection is respectfully traversed. The resilient bushing 22 of *Bodine* supports the bit within the base of the drill collar 11. The suspension allows the bit to vibrate in nutating or nodding motion. Thus, at column 2, line 53 *et seq.*, it is noted that "shoulder plate 18 continually rolls about smoothly around the bottom edge of jacket 25, thus not inducing vibration into the jacket 25 or collar 11." Similarly, at column 2, line 22 *et seq.*, it is noted that "rubber bushing 22 is attached to jacket 25, plate 18 and casing 20a of the oscillator, as for example, by vulcanization to these parts, this bushing holding the parts together resiliently for relative motion between the oscillator and jacket portion 25, and functioning as

a mud seal so that mud flow from the drill collar is forced to flow through the stem into the bit port or the nozzle orifice 38." In column 3, line 52 *et seq.* note that "one feature of this invention is the employment of straight mechanical motion, that is without using elastic vibration." From these descriptions, it is evident that the bushing 22 does not transmit torque and weight between the drill collar 11 and the bit 16 as recited in Applicants' Claim 1 wherein the bit 16 is the first member and the second member is the plate 18. It is respectfully noted that the composition of the bushing 22 is not a "hydrogenated nitrile rubber having a Shore A hardness of at least 80" as recited in Applicants' Claim 9.

Applicants' Claim 14 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Frear et al.* in view of *Leroy*. This rejection is respectfully traversed. The *Frear et al.* reference fails to meet the recitations of Applicants' Claim 1 for the reasons previously advanced. The patent to *Leroy* also lacks a teaching of a resiliently deformable connecting member for tilting the first member with respect to the second member while transmitting torque and weight as recited in Applicants' Claim 1.

In view of the foregoing amendments and argument, it is respectfully submitted that the application is in condition for allowance, and such action is earnestly requested.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence and all referenced enclosures are being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, DC 20231 on March 4, 1999.

Carlos A. Torres